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ABSTRACT

The need to associate bilingual-bicultural learning environments with the development of multidimensional cognitive processes is one of the issues discussed in this paper. Bilingual education is envisioned in terms of affecting a dramatic and progressive trend in the cognitive growth of children. The principal developmental gains found in many Spanish/English bilingual education programs are said to be seen in the progress made by Mexican American children in Spanish language development and in certain affective variables. However, it is held that cognitive development in a multiplicity of variables through the medium of Spanish cannot always be ascertained; also, curricula, incorporating multidimensional cognitive variables at more advanced grade levels, have not yet been completely conceptualized or implemented. The theme of this paper reflects these concerns, among others, coupled with prospective alternatives for giving greater emphasis or extending curricula and instructional changes in bilingual education. It is stressed that the bilingual educator must be a facilitating agent in cognitive development. (Author/AM)

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COGNITIVE DEVELOPMENT IN BILINGUAL-BICULTURAL EDUCATION

A MULTI-DIMINSIONAL MODEL

by

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Introduction

Research and evaluation studies consistently have revealed that cognitive achievement of children in bilingual education programs is comparable to that of children in non-bilingual education classrooms. The comparisons are usually given with reference to standardized achievement tests in English where indentification and labeling of science, mathematics, social studies, and aesthetic concepts are covered. Since it is difficult or illogical to administer Spanish cognitive tests among non-bilingual program children, except to a limited degree where examinations can be conducted to compare Spanish oral development among Spanish-speaking children in bilingual and non-bilingual classrooms, research studies showing differences in cognitive development in Spanish between program and non-program children are relatively absent or limited in scope. And wherever cognitive achievement in Spanish is reported, it usually is given in terms of ability to identify or label concepts relative to the aforementioned subject-matter areas.

Apart from the need of designing new test instruments and processes for measuring multi-dimensional cognitive

variables, there is an immediate need to associate bilingual-bicultural learning environments with the development of multi-dimensional cognitive processes. To accomplish this, it is essential for bilingual educators to ascertain the universality or differences in cognitive skills found in the cultural milieu of Spanish-speaking or bilingual children as compared to that of middle-class English-speaking Americans.

This theme underscores the proposition of envisioning bilingual education in terms of affecting a dramatic and progressive trend in cognitive growth of children. It proposes that, while the inclusion of native cultural attributes in the educational environment will reinforce pride in culture and further the communications skills in the native language, we must also provide children with an extensive repertoire of cognitive skills that will assist them in dealing with current and future phenomena--events, problems, and relationships occurring in a multicultural and multi-dimensional (humanistically and technologically oriented) world.

Specifically, current research in bilingual education shows excellent progress in advancing Mexican American children in Spanish language development (including

reading and writing) and in particular affective variables, such as greater confidence and ability to interact in small groups, increased responses to teacher questions, and knowledge pertaining to other native cultural features. While these represent the principal developmental gains found in many Spanish/English bilingual education programs, cognitive development in a multiplicity of variables through the medium of Spanish cannot always be ascertained. Coupled with this problem is the fact that curricula, incorporating multi-dimensional cognitive variables at more advanced grade levels, have not yet been completely conceptualized or implemented. In many of the existing programs, further training is needed to familiarize educators with implementation of multi-dimensional cognitive variables in bilingual education, with consideration to factors that appear to be generalizable in a cross-cultural perspective, and with the examination of variables that appear to be ethnically unique as compared to those usually found in the English monolingual middle-class oriented school. The theme of this paper reflects these concerns, coupled with prospective alternatives for giving greater emphasis or extending curricula and instructional changes in bilingual education.

Culture and Related Cognitive Variables

Research studies show that it is not as difficult to identify differences in cognitive style between a group in a primitive cultural setting and one in an advanced technological environment.[1] Research studies also reveal some differences in cognitive styles between schooled and unschooled persons in a given society (considering, too, that the school person has gained a greater number of cognitive alernatives).[2] Further, it is found that some differences in cognitive styles appear among rural-agrarian people as compared to urban people.

Scholarly treatises on the subject of cognition indicate that relatively little is known about the supply of amplifiers and demands provided by a culture.[3] It is known, however, that cultures vary widely in respect to the manner in which they empower their members with skills, images, and values; but it is not clearly known how the empowering occurs. It is also known that cultures differ on the ranges of alternatives fitted together into superordinate or hierarchical structures. However, the degree of difference in reference to these alternatives is also dependent on the ralative distance of the cultures (geographically and in terms of cultural mores).

In terms of the abovementioned research findings, what can be hypothesized with respect to the Mexican American? Any studies in reference to the precise indentification of cognitive styles among Mexican Americans will necessarily involve multiple variables and highly complex analyses. And it is very likely that the generalizability of the findings will still be questionable. At best, this type of research may generate hypotheses for other studies with respect to given sampling groups and related conditions.

Some general observations can be given in reference to the Mexican American. First, Mexican Americans live and work in a technologically oriented nation. Second, many Mexican Americans have been in the military and have seen people and regions in other parts of the world. Third, the majority of the population is concentrated in the urban centers of the nation, with a higher representation in the western states. Fourth, the migration of Mexican Americans from rural farm areas to the city is relatively recent as compared to the middle-class Anglo American. Fifth, a greater number of Mexican Americans have not completed high school as compared to middle-class Anglo Americans. Sixth, a greater number of Mexican Americans have lower incomes and non-professional (white collar) jobs as compared to middle-class Anglo Americans.

Given the abovementioned factors, what is the degree of reference given by Mexican Americans to cognitive processes acquired in their own cultural milieu, as well as to those acquired in other spheres of their total perceptual and experiential world? And to what degree are these processes transferred to the present generation of youngsters in the various environmental (home and geographical) settings across the nation? Further, to what degree are these processes similar or different to those practiced and reinforced in middle-class Anglo America?

While we wrestle with the foregoing questions through complex research proposals, we can anticipate with a high degree of probability that the present generation of youngsters in our schools will need a greater number and variety of cognitive skills than those of their ancestors. Most relative to the implementation of curriculum and instruction in bilingual education is the following:

> Insofar as man's powers are expressed and simplified through the instruments of culture, the limits to which he can attain excellence of intellect must surely be as wide as are the culture's combined capabilities. We do not know in any deep sense as yet how we shall, in the future, better empower men. Insofar as the sciences of knowing can throw light on the growth of mind, the efficacy of the culture in fulfilling its responsibility to the individual can likely be increased to levels higher than ever before imagined.[4]

Thus, let us envision bilingual-bicultural education with flexible approaches to cognitive processes. Where a learning style tends to accelerate cognitive and affective gains among individuals or groups of individuals, we must allow for its application. And while we may not necessarily have immediate knowledge of variances in learning styles among individuals or groups, we can explore or hypothesize and incorporate processes that reflect increased notivation and more advanced cognitive responses among the learners.

Bilingual education need not limit the learner to cognitive processes inherent in his native culture, for if bilingual education provides the learner with reinforcing elements from this native culture that are advantageous to his cognitive development and psychological well-being, there is little chance that the acquisition and internalization of additional cognitive processes (i.e., from

the technical world) will completely transform him into a monocultural person. In a broader sense, the acquisition and extension of cognitive and affective processes learned from his bicultural experiences in school and other settings will better prepare him to cope with phenonmena in a multi-dimensional and multicultural world.

A Comparative Analysis of Programmatic and Non-Programmatic Effects in Bilingual Education

It is conceivable that a schooled person in the Western World, at any given age beyond 5 years, will have acquired a more extensive repertoire of cognitive skills as compared to an unschooled person. Assuming that two persons beginning at age 5, for example, continue to live in the same cultural milieu (excepting school), the person being exposed to an organized curriculum will acquire a greater variety of concepts and ways to handle problems as compared to the unschooled person. And assuming that two persons (with other factors remaining relatively constant) are exposed to organized curricula, but one of the persons is given a curriculum based on a monolingual model, while the other is given bilingually-biculturally oriented curriculum, one would have to surmise that the latter person's perceptual and experiential world will continue to expand to a greater degree. Why is it, then, that Mexican American children in many of our present-day bilingual education programs are not necessarily scoring higher in English standardized tests as compared to Mexican American children

in English-monolingual programs? (Yet, it would be folly to extend judgment on the effectiveness of bilingual education programs based on this one particular observation). In analyzing all of the comparative factors, it is obvious that two groups, with similar cultural backgrounds, are being exposed to schooling through the medium of a second language and other related cultural variables. If the learning conditions tend to be relatively similar in reference to the English curricular component, the differences in achievement between the two groups, if any, will probably be small and insignificant.

In analyzing the foregoing, another question is anticipated. If bilingual education proposes to facilitate and enhance the learning process (therefore, the cognitive and affective development of children), then, to what extent are hypotheses based on this variable supported through related findings in research studies? The question cannot be categorically answered, for research, including a multiplicity of cognitive variables measured through the medium of two languages, is not yet available. And where English standardized instruments are used to measure a selected number of cognitive areas familiar to both bilingual education and non-bilingual education teachers, it is conceivable that this awareness by teachers will

influence the learning objectives, style of content, and instructional processes covered in the English-based curriculum. On the other hand, it can be safely hypothesized that children in the bilingual education program will increase in selected components of the native language, coupled with extended knowledge of concepts related to their cultural heritage. It is in reference to cognitive and affective gains in these components that unequivocable credence can be given to present-day bilingual education programs.

Another question pertains to the notion of transfer of learning. If it is assumed that a child is gaining additional concepts through a language other than English, coupled with opportunities for cognitive and affective development in that language, is it not conceivable that this will have a positive transfer effect that will influence higher scores in English achievement tests? This, again, is a researchable question. For if the same cognitive skills are being extended in English as in Spanish, what will be the nature of the transfer? It is already established that children in bilingual education programs, as compared to children in non-bilingual programs, have greater facility

in identifying and labeling of concepts in the native language. This is an added dimension in the cognitive schemata of bilingual children; however, since the learned concepts do not necessarily rank higher in cognitive structure than those given in English, the additional dimension assumes a horizontal rather than a hierarchical progression. This often occurs where instructional resources (media and materials at various levels) are not as available as those in English, or where the instructional time in the curriculum tends to favor the English component.

Based on the aforementioned analyses, it is, therefore, proposed that other factors must be considered for affecting an accleration in cognitive development among Mexican American children. Since languages serve as a facilitating medium, they can be envisioned as an advantageous reference base for the child in his education. Allowing for language and other related cultural attributes, what other important elements are essential for enhancing the cognitive development of Mexican American children?

Multii-Dimensional Models in Bilingual Education Curriculum

Current literature on the subject of bilingual education curriculum models usually provide a comparative description of the cultural maintenance and acculturation types, as well as models which accommodate monolingual English speakers, monolingual Spanish speakers, and/or bilingual (Spanish/English) speakers. Some models are depicted in concentric circles, while others are illustrated in vertical and horizontal dimensions in terms of time, curriculum, and bilingual involvement.

Some of the models drawn in a vertical/horizontal matrix simply illustrate the role of two languages (first and second) in the curriculum, with the models differing in respect to the original linguistic reference base of the students. The configurations in Figure 1 show curriculum models for three types of language groups.

- Time -

Curric. Content	SIM	SIM	SIM	BIM
1st. Lang. Dev.	SLA	SLA	SLA	SLA
2nd. Lang. Dev.	ESL	ESL	ELA	ELA

Model for
Monolingual Spanish Speakers

Curric. Content	EIM	EIM	EIM	BIM
1st. Lang. Dev.	ELA	ELA	ELA	ELA
2nd. Lang. Dev.	SSL	SSL	SLA	SLA

Model for
Monolingual English Speakers

Curric. Content	BIM	BIM	BIM	BIM
1st. Lang. Dev.	SLA	SLA	SLA	SLA
2nd. Lang. Dev.	ESL	ELA	ELA	ELA

Model for
Bilingual (Span./Eng.) Speakers

SIM= Spanish as Instructional Medium

SLA= Spanish Language Arts

ESL= English as a Second Language

BIM= Bilingualism as Instructional Medium

EIM= English as Instructional Medium

ELA= English Language Arts

SSL= Spanish as a Second Language

Figure 1

It is assumed from the foregoing models that the language and other related cultural features are incorporated in the curriculum and learning processes, with the expectation that children in the program will eventually operate bilingually and, in varying degrees, biculturally. This objective is being realized in many present-day programs. Yet, as was mentioned earlier, the comparative degree to which cognitive development can be advanced in reference to both languages needs further study.

Other models illustrated in concentric circles give a more detailed reference to the ralationship of curricular areas to languages. In some instances, too, they carry a philosophical frame of reference in terms of the educational process. One of the models by Dolores Gonzales, for example, suggests the integration of subject-matter areas through themes related to the student's perceptual-experiential world.[5] And the communication arts, reinforced by references to cultural content, are shown as media to expand the conceptual and language base of the learner.

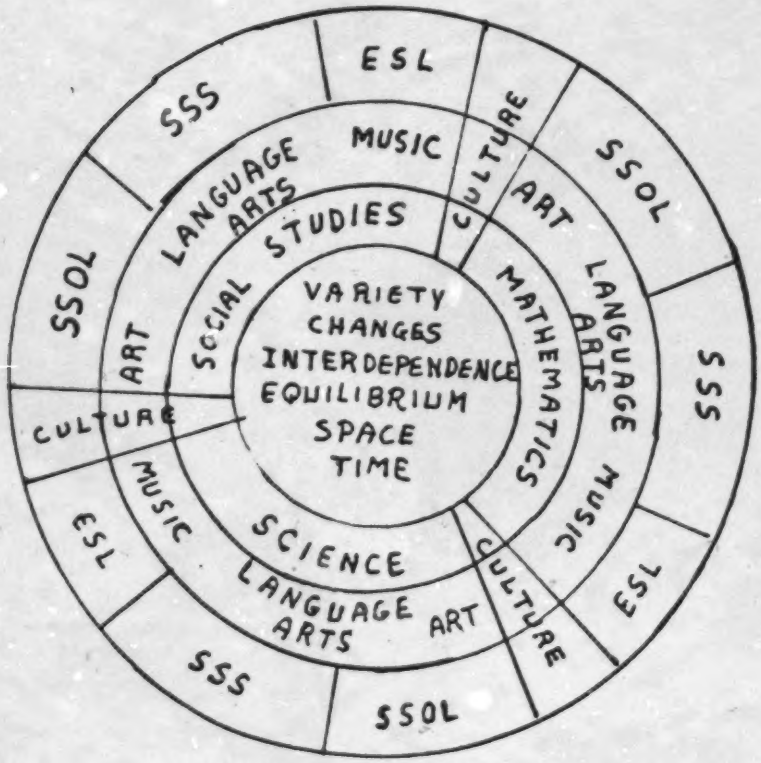

Figure 2
Concentric Bilingual Education Model

Gonzales gives reference to five factors in the model (variety, change, interdependence, time and equilibrium), which offer opportunities for the facilitating teacher to affect dramatic and significant cognitive and affective development of students.[6] These can be advantageously incorporated in a bilingual-multicultural learning environment. And as these factors are analyzed for meaning, their relationship to cognitive development become apparent. Variety gives reference to objects, people, events, and other phenomena in the perceptual-experiential world of the child. In this sense, it offers the substance and processes for dealing with cognitive growth. Change is viewed as a constant element in the environment, for it is through this medium that discovery and experimentation are facilitated. Interdependence is considered an important feature in demonstrating the relationships which constitute the very essence of existence. It offers a dimension to both cognitive and affective growth, for animals and plants depend on each other for survival, as do men, cities, and countries. Space and time lend themselves for the clustering of content related to where man lives, as well as to the activities important to him and others around him. And equilibrium

serves to create an awareness of native cultural heritage and the need to conserve national resources. In terms of growth and development, it also provides the quest for accommodation--the motivation to explore, inquire and apply cognitive skills in dealing with everyday problems.

The Bilingual Educator--A Facilitating Agent in Cognitive Development

The bilingual educator must be more than a carrier of knowledge--he must be a person who has acquired and practiced approaches to facilitate learning rather than to simply transmit knowledge. Knowledge is acquired through the multiplicity of resources available for children in the learning process; these resources must contain

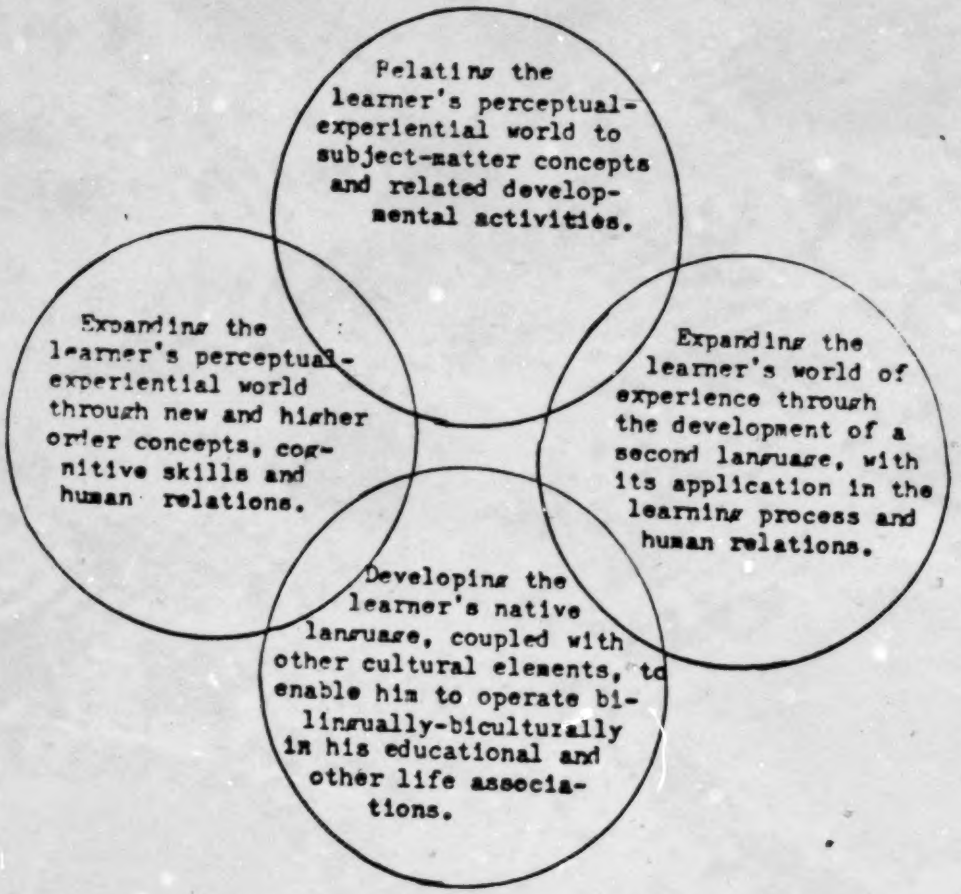
Relating the learner's perceptual-experiential world to subject-matter concepts and related developmental activities.
Expanding the learner's perceptual-experiential world through new and higher order concepts, cognitive skills and human relations.
Expanding the learner's world of experience through the development of a second language, with its application in the learning process and human relations.
Developing the learner's native language, coupled with other cultural elements, to enable him to operate bilingually-biculturally in his educational and other life associations.

Figure 3

meaningful and motivational elements for students. Recognizing this principle, the teacher will plan activities with students so that multi-stimuli is available to advantageously contribute to the cognitive and affective growth of students.[7]

In the abovementioned frame of reference, subject-matter becomes the substance within the learning process rather than the end. Subject-matter concepts serve as references for the learner as he advances cognitively, affectively, and psychomotorically. The learner need not stumble into cognitive processes such as convergent or divergent thinking, inquiry or discovery learning, inductive and deductive reasoning, and analytical and synthetical processes. These are processes that the competent teacher proposes as principal objectives coupled with planned activities, while subject-matter concepts and languages serve as facilitating agents. In time, the learner will forget many subject-matter elements; on the other hand, he will be less likely to forget a cognitive skill--especially if the skill has been applied in association with concepts from various desciplines and in the resolution of given problems. Moreover, the student will be able to apply a cognitive skill in relearning or reinforcing a previously learned or

forgotten concept.

A cognitive skill learned in one language can later be applied through another language, without having to relearn the skill. All of the aforementioned cognitive processes, including others such as classification, differentiation, seriation, conservation and transformation are transferable from English to Spanish or vice versa. In essence, bilingual education is not designed to retard cognitive development; by its very nature, it offers the student alternative languages and related cultural concepts for extending and applying cognitive processes. Thus, where cognitive skills are identified as principal objectives, and stimuli and conditions are offered in terms of concepts associated to subject-matter areas and environmental and experiential elements, it is possible that cognitive growth of Mexican American youngsters can be dramatically enhanced through bilingual education.

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[3]Ibid., p. 321.

[4]Ibid., p. 326.

[5]Dolores Gonzales, "The Elementary School Curricula: Gateway or Barrier," Selected Readings in Multicultural Education (Edited by A. A. Valencia). New Mexico Highlands University Press, Las Vegas, New Mexico, March, 1974, p. 24.

[6]Ibid., p. 25.

[7]Atilano A. Valencia, "The Forgotten Objectives in Bilingual Education", Selected Readings in Multicultural Education". New Mexico Highlands University Press, Las Vegas, New Mexico, March, 1974, p. 12.